THE ISOLATION OF SALMONELLA TYPHI-MURIUM FROM FERRETS

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Ferrets for use as test animals in a series of studies of a viral agent were purchased from an outside source. Animals so obtained for use at this laboratory are held for an observation period of 3 weeks, a time which exceeds the incubation period of the viral infection.

At the expiration of the observation period for one shipment of ferrets three animals of the lot were inoculated with virus from the same source. One of the three animals was sacrificed for serum the day following inoculation, and the organs were not cultured. The livers and spleens of the remaining two animals were cultured, at the time of tissue harvest, on blood agar. The organs from one of the animals gave rise to no growth. A gram-negative rod in pure culture was isolated from the other. The spleen of the infected animal was triturated and inoculated into two ferrets. The temperature curves of these two animals were not characteristic of the type commonly found to result from the viral agent used. Ten days following inoculation one of the animals was moribund. Both were sacrificed.

Post-mortem examination showed emaciation of both animals. Both exhibited conjunctivitis with a clear watery discharge. In one, balanitis with a purulent exudate was present. A dark fibrinous exudate in the lower intestine of one animal was matched in the other by a tarry content throughout the intestinal tract. Petechial hemorrhages in the gastric mucosa indicated the probable source of the digested blood in the latter animal. Except for a marked anemic condition, other visceral organs appeared normal. These findings, suggestive of paratyphoid infection, necessarily represented a subacute rather than a chronic form of the disease as commonly observed in related species of animals. Symptoms of emaciation, conjunctivitis, and balanitis indicated the probability of infection prior to artificial inoculation.

Bacteriological cultures of livers and spleens were prepared on blood agar. Cultures of *Salmonella typhi-murium* were obtained from both animals without interference of contaminants.

The organism isolated was a gram-negative, motile, aerobic rod. It produced no indole when grown in tryptone broth. Nitrates were reduced to nitrites.

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H_2S was produced when the organism was cultivated on Kligler iron agar. It reacted negatively to the Voges-Proskauer test and positively to the methyl-red test.

Acid and gas were formed from glucose, mannitol, fructose, arabinose, xylose, dulcitol, inositol, trehalose, and maltose. Lactose and sucrose were not attacked. The antigenic formula was determined as IV, V, XII, i, 1, 2, 3.[3]

Subcultures of the organisms were inoculated into a ferret and into mice. A 24-hour plate culture suspended in 10.0 ml physiological saline was inoculated subcutaneously in 0.2-ml amounts into each of five mice. The ferret received 1.0 ml of this suspension subcutaneously. All mice were dead at the end of 18 hours. The ferret was found dead at 36 hours. The most pronounced lesion in the inoculated ferret was a suppurating ulcer at the site of inoculation. Pure cultures of *S. typhi-murium* were recovered from the spleen and liver. No attempt was made to recover the organism from the inoculated mice.

So far as we are aware paratyphoid infection has not been previously described in ferrets. Dr. P. R. Edwards of the National Salmonella Center, in a recent communication, states that he has no record of any *Salmonella* being isolated from this species.

SUMMARY

The isolation of *Salmonella typhi-murium* from ferrets is recorded. The symptoms and pathologic findings associated with paratyphoid infection are given, and the isolated organism is described. So far as we are aware no *Salmonella* has previously been described from ferrets.

[3] The antigenic formula was determined by the Division of Bacteriology, Army Medical Department Research and Graduate School.